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(54) **HOOKED DIFFERENTIAL MOBILITY SPECTROMETRY APPARATUS AND METHOD THEREFORE**

(75) Inventors: **Alexandre A. Shvartsburg**, Richland, WA (US); **Keqi Tang**, Richland, WA (US); **Yehia M. Ibrahim**, Richland, WA (US); **Richard D. Smith**, Richland, WA (US)

(73) Assignee: **Battelle Memorial Institute**, Richland, WA (US)

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See application file for complete search history.

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Primary Examiner—Nikita Wells
(74) *Attorney, Agent, or Firm*—James D. Matheson

(57) **ABSTRACT**

Disclosed are a device and method for improved interfacing of differential mobility spectrometry (DMS) or field asymmetric waveform ion mobility spectrometry (FAIMS) analyzers of substantially planar geometry to subsequent or preceding instrument stages. Interfacing is achieved using curved DMS elements, where a thick ion beam emitted by planar DMS analyzers or injected into them for ion filtering is compressed to the gap median by DMS ion focusing effect in a spatially inhomogeneous electric field. Resulting thinner beams are more effectively transmitted through necessarily constrained conductance limit apertures to subsequent instrument stages operated at a pressure lower than DMS, and/or more effectively injected into planar DMS analyzers. The technology is synergetic with slit apertures, slit aperture/ion funnels, and high-pressure ion funnel interfaces known in the art which allow for increasing cross-sectional area of MS inlets. The invention may be used in integrated analytical platforms, including, e.g., DMS/MS, LC/DMS/MS, and DMS/IMS/MS that could replace and/or enhance current LC/MS methods, e.g., for proteomics research.

43 Claims, 9 Drawing Sheets